

ARIZONA



A C C E S S  
M A N A G E M E N T

# TAC Meeting #5

*September 26, 2006*



# **Welcome/Introductions**



# Meeting Agenda

1. Welcome/Introductions
2. Project Progress
3. Access Classification Assignment Activities
4. Access Design Practices

***BREAK***

5. Program Framework
6. CCP outreach plans and activities
7. Next Steps



# Progress since last TAC Meeting

- **First Elected Official Briefing-  
Central Yavapai MPO**
- **Inter Tribal Council  
Transportation Committee  
Briefing**
- **Additional District Classifications  
completed**
- **District Classification System  
Reviews**



# **Access Classification System**



# District Classification Reviews

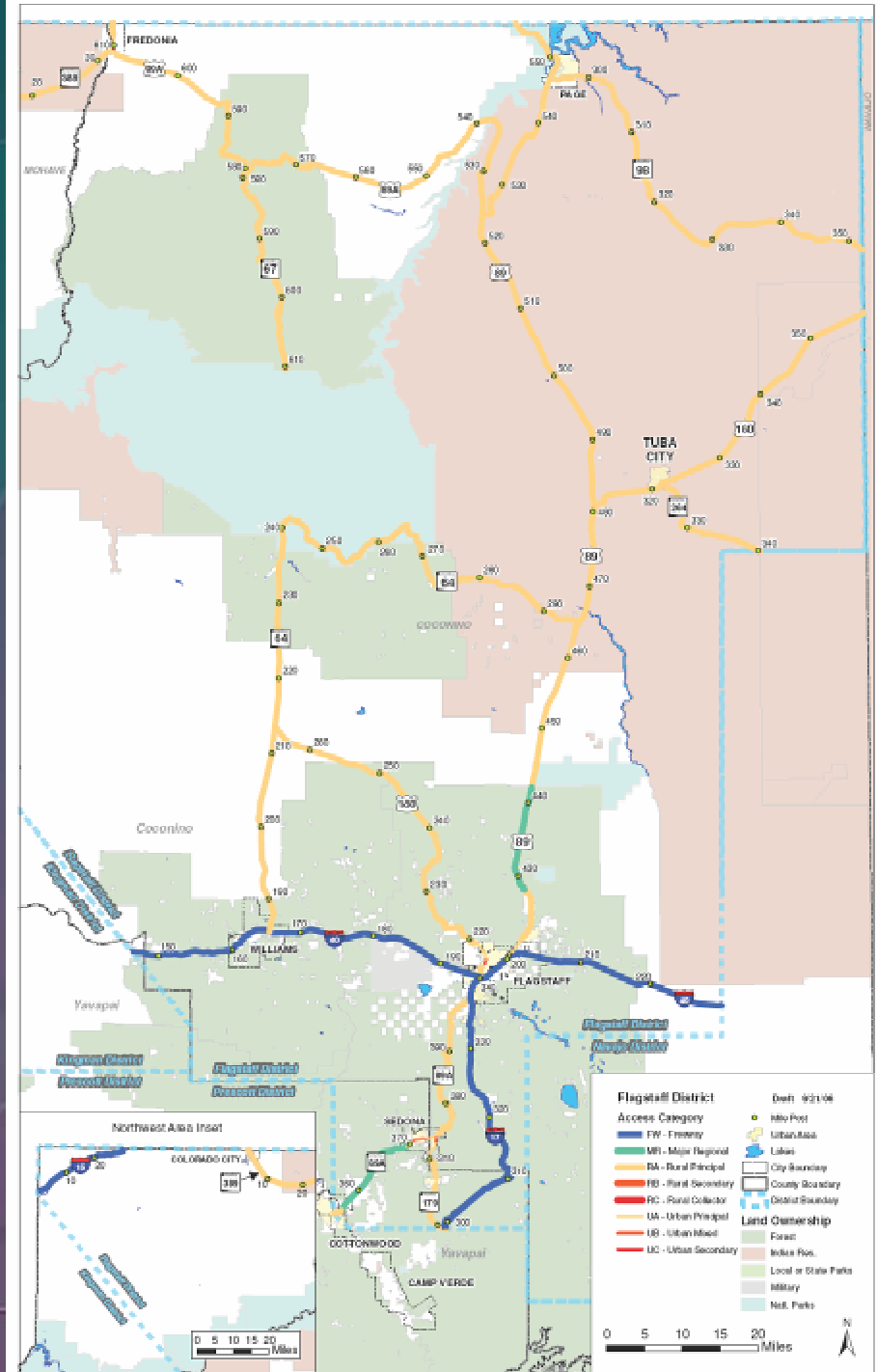
- **Kingman and Flagstaff Districts completed**
- **Great feedback and refinement**
- **Categories seem to work well**
- **Schedule remaining districts over next month to six weeks**
- **Local Agency Review after that.**



# Kingman District Access Category Assignment Map



# Flagstaff District Access Category Assignment Map



# Proposed Categories (August 31 '06)

FW (freeway)

MR (major regional)

RA (rural principal)

UA (urban principal)

RB (rural secondary)

UB (urban mixed)

RC (rural collector)

UC (urban secondary)

SF (service and frontage roads)



# Access Location and Design

- Processing of access requests.
  - 1 - Access category - is direct access allowed.
  - 2 - Design requirements.
- Design standards are necessary for consistency
- The design standards and related elements will occupy two portions of the access management manual.
  - A general chapter on design.
  - And Board adopted rules



# Location and Design Standards

- National practices
- Arizona practices
- Process will provide a technical memo
  - All access design elements addressed
  - Background information on each
  - Standards and practices
  - Design deviations



# For Each Access Design Element

- Describe the element by text and diagram
- Explain the purpose and benefits of the design element including any human factor issues.
- Describe the minimum to maximum range of each design element and how the range effects safety, capacity and operation.



# Design Practices

- Formulate an initial draft set of recommended design standards
- Include the rational for each element
- Work with internal technical design group



# Access Design Elements will include

- Driveway Geometrics
  - Width, radius, shape, type
- Turn Lanes, warrants and design
  - Right and left deceleration lanes
  - Right and left acceleration lanes
- Access location and spacing
- Location and spacing of signals
- Medians



# Other Access Design Issues

- Visibility of the access connection
- Sight Distances
- Selection of the Design Vehicle
- Drainage
- Cattle guards and gates
- Emergency access only.
- Earthwork.
  - Side slopes at access, erosion control.
- Design Variances
  - Exception and Waiver Procedures



# Example of Design Element Detail









# Decel lanes with bike accommodation



# Reasons for Using Deceleration Lanes

- Safety
- Increased Capacity
- Reduced Delay
- Reduce Fuel Consumption
- Traffic Progression on Urban Major Roadways



# Deceleration Lanes

- Elements of length
  - The length - including taper, deceleration and storage
- Adjustment for grade

## Other details that must be included

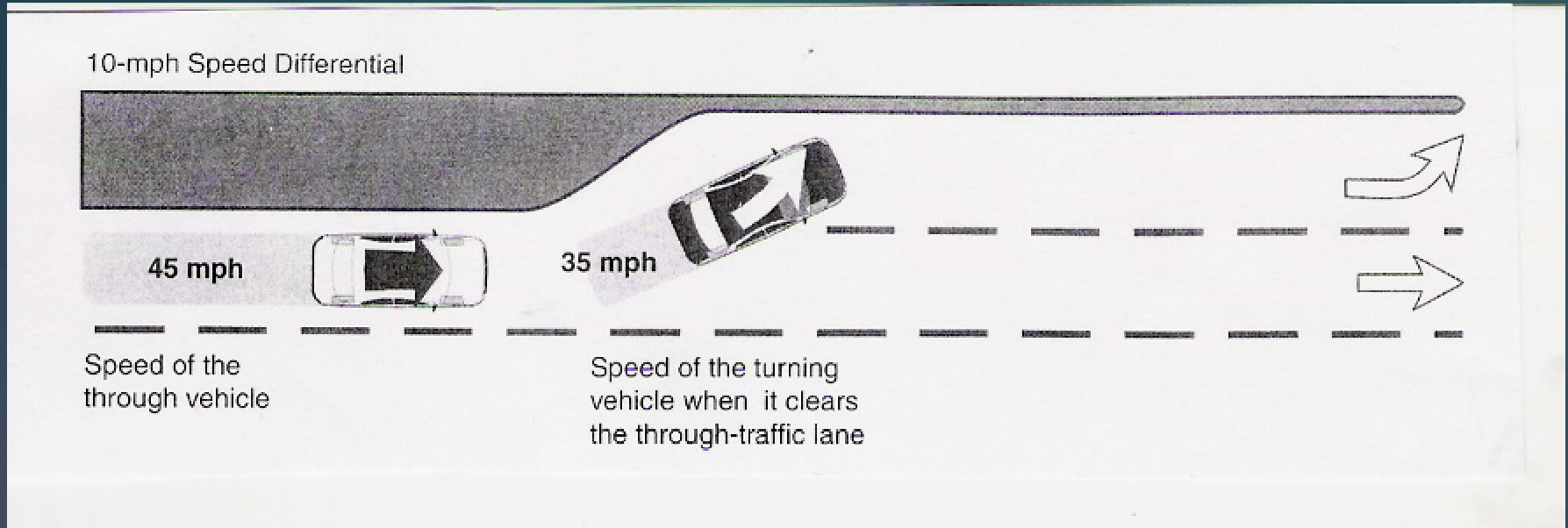
- Taper design: reverse curve vs. straight taper, urban/curb and gutter, rural/paved shoulders
- When to use dual left-turn lanes
- Isolated left-turn treatments
- Median design variations depending if the median is raised or flush (painted)



# Redirect Taper Example



# Schematic Illustration of a 10 mph Speed Differential



The crash potential increases exponentially  
As speed differential increases



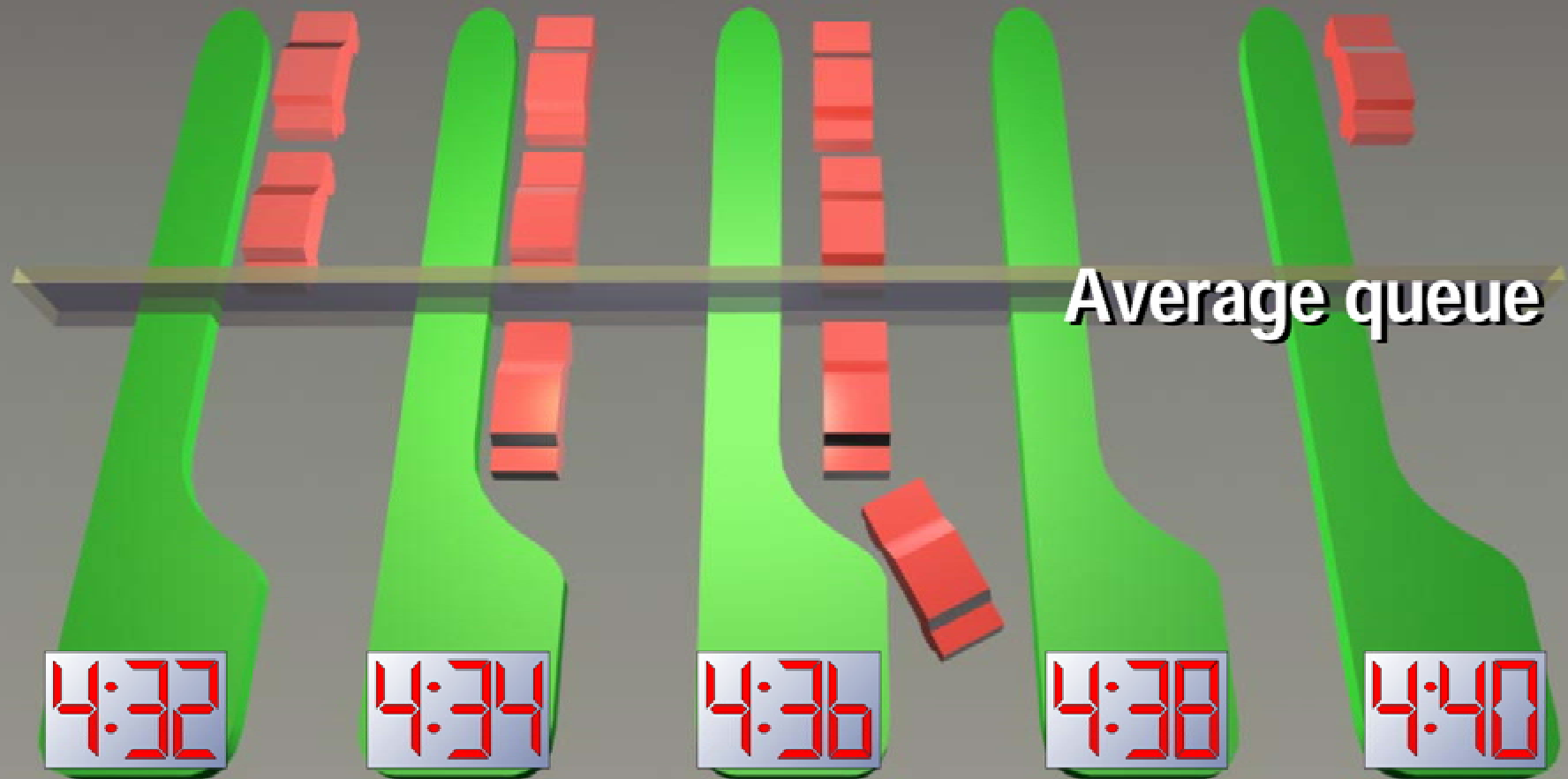
This left turn is back to back with another.  
It lacks both decel length and storage. It fails mostly in the peak hour of the arterial



Queues backed into through traffic.



# Why Designing for Average Queue will cause some failures



average queue = 2 cars

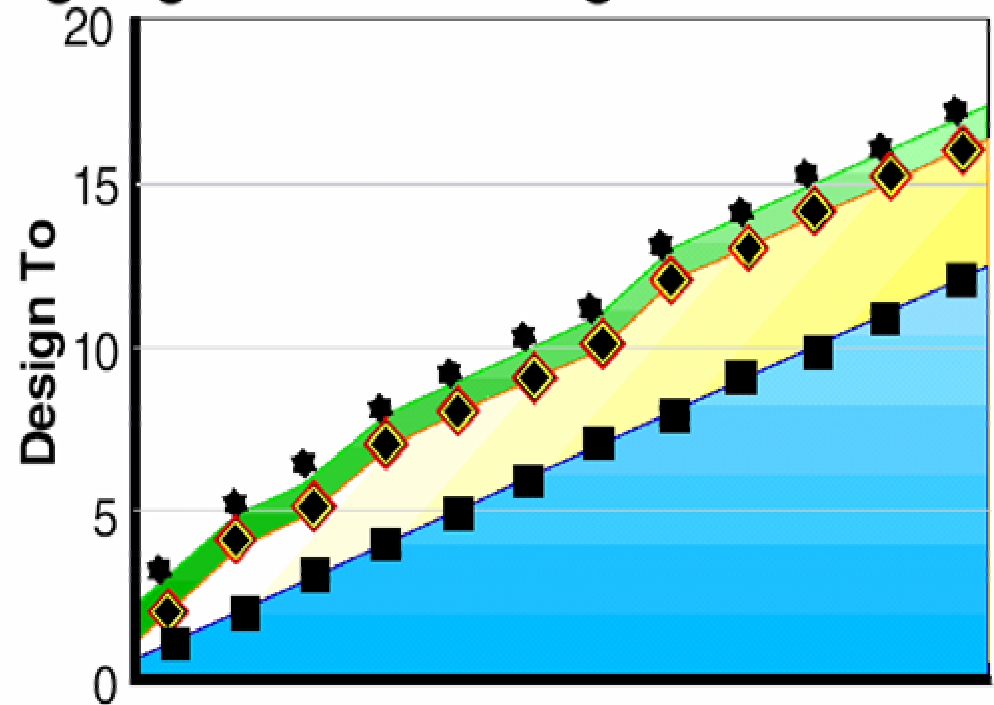
40% failure rate

# What a difference more storage can make

## Remember:

you need almost twice  
the average queue  
for storage length

## Designing Left Turn Storage for Success



Average Demand Per Cycle	1	2	3	4	5	6	7	8	9	10	11	12
30-40% Failure	1	2	3	4	5	6	7	8	9	10	11	12
10% Failure	2	4	5	7	8	9	10	12	13	14	15	16
5% Failure	3	5	6	8	9	10	11	13	14	15	16	17

Source: Use of Poisson Aproxmation

# Acceleration Lanes

- Why needed/when to use: safety, traffic operations
- Design elements: length, taper, width
- Acceleration-maneuver distance
- Taper length
- Adjustment for grade



# Driveway Design

- Design vehicle (car? bus? large truck)
- Driveway type – curb cut, flare (dustpan), radius return (turn-out).
- Driveway width and radius
- Throat Length for signalized and unsignalized access
- Profile grade including grades and sidewalk location
  - Sidewalk, pedestrians and ADA
- Signing and pavement markings
- One-way and two-way driveways
- Angle of access approach (90 to 60 degrees)



# Driveways Also Mean Pedestrian Conflicts





# Access Location & Design

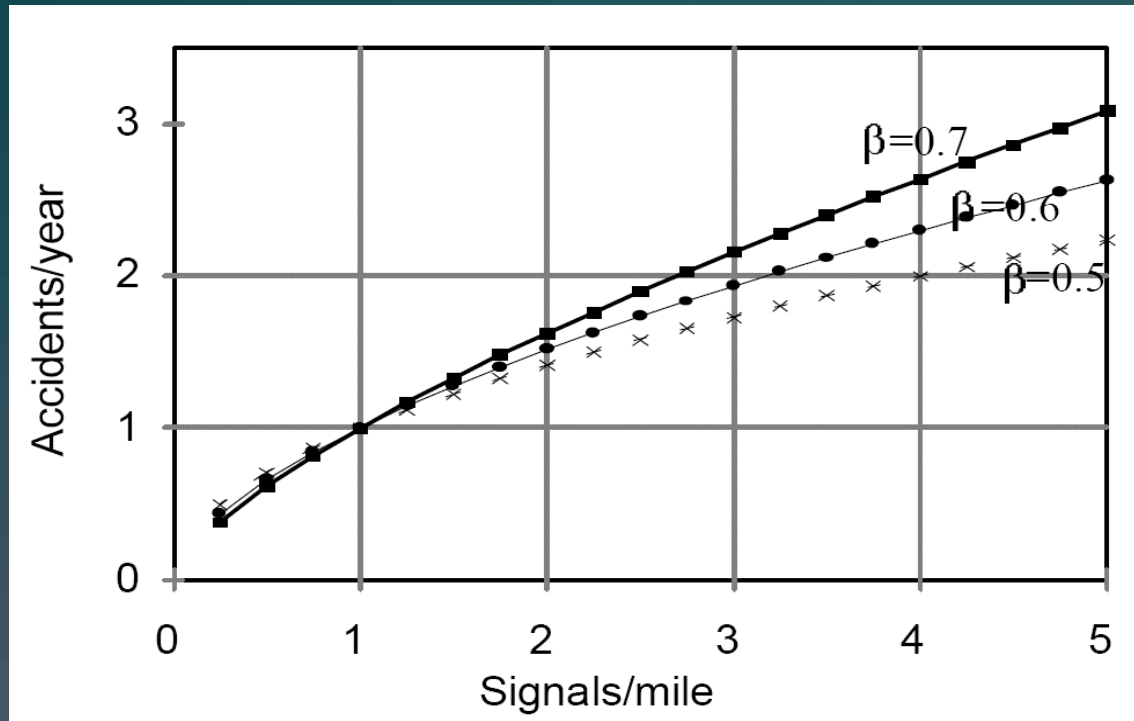
- Access location and spacing
  - Sight distance criteria, using stopping sight distance, intersection sight distance, decision sight distance
  - Right-turn conflict overlap prevention
  - Functional intersection distances
  - Deceleration-maneuver distances
- Use of posted or prevailing speed
- The driving task and perception-reaction time; elderly drivers
- Sight distance selection issues
  - Adjustment for grade, minimums, desirable, multi-tasking
  - Corrective and maintenance measures
- Variation in access spacing and location criteria by access category



# Signal Spacing

- Effect of spacing on traffic progression
- Accumulative impacts on delay, average travel speed and travel time
- Impacts on safety
- Selection of a uniform signal spacing interval
- Deviation from the selected interval





If traffic that needs to enter a road is served by 2 signals per mile instead of 1 per mile, the number of intersection accidents is increased by 40% to 60%.



# Medians

- Nontraversable median vs. continuous two-way left-turn lane (TWLTL)
- When to replacing a TWLTL with a nontraversable median
- Median width
- When to allow median openings
- Directional median opening
- U-turns
- Landscaping the median (sight distance)



# Design Admin & Process

- Evaluation of requests for access connections: “Things to look for”
- Criteria and procedures for request for deviations from access location, spacing and design standards
- Design reviews
- Field Inspection



# ACCESS DECISIONS

## Access Permitting Process

- ❖ *Permits Issued*
- ❖ *Local Land Use Reviews*
- ❖ *Access Management Plan Participation*
- ❖ *Unit Reporting and Management*
- ❖ *Local Agency Coordination*
- ❖ *Traffic Impact Analysis Reports*
- ❖ *Driveway Access Construction*
- ❖ *Access Related Roadway Construction*

## Arizona Highway Projects

- ❖ *Roadway Design Driveway and Intersection Decisions*
- ❖ *Project Related Access Closures*
- ❖ *Access Management Plans*
- ❖ *Right of Way Acquisition and Access Control*
- ❖ *Project Related Access Closures*
- ❖ *Access Management Plans*
- ❖ *Interchange Design and Access Management of Approaches*
- ❖ *Access Controls for Freeways*

## Planning

- ❖ *Move AZ*
- ❖ *Budget Planning*
- ❖ *Air Quality Benefits of AM*
- ❖ *Data and Information*

## Right of Way Activities

- ❖ *Appraisal of Access Changes for Compensation Value*
- ❖ *Acquisition Agent Guidance*
- ❖ *Access Reductions by Acquisition*
- ❖ *Access Change Damage Claims*
- ❖ *Condemnation Proceedings Involving Access Issues and Damages*

## Local Agencies

- ❖ *Land Use Plans*
- ❖ *Zoning Ordinances and Development*
- ❖ *Subdivision and Exceptions*
- ❖ *Traffic Impact Reports*
- ❖ *Adopted Comprehensive Plans*
- ❖ *Annexation and Growth Boundaries*

## Transportation Board

- ❖ *Access Policies*
- ❖ *Budget Allocations*
- ❖ *Capital Investment Strategies*
- ❖ *Safety and Mobility Policies*
- ❖ *ADOT Organizational Structure*

## ADOT Construction Practices

- ❖ *Adherence to Design and Driveway Decisions*
- ❖ *Quality Assurance for Driveway Construction*
- ❖ *Materials and Specifications for Private Access*

## Traffic & Safety Programs

- ❖ *Identification of High Crash Rates Related to Access*
- ❖ *Identification of Access Related Congestion*
- ❖ *Crash Histories and Reporting Requirements*
- ❖ *Access Related Safety Project Funding*

# Framework

- Developing new concepts for ADOT administrative structure for access permitting.
  - Lead office at HQ? Responsibilities?
  - District permit officers report to?
- Procedures for working with local governments on permitting
- Access permitting process



# **Communication and Community Partnerships Outreach Plan**



# Next Steps



# Next Steps

- **Completed District Classifications and Review**
- **Begin Design Guideline review-  
Create working group**
- **Continue Elected Official briefings**
- **Transportation Board briefing  
- October 18th**

